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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,348	03/04/2002	Gaelle Chauvelon	001K US 3808	1888

466 7590 12/18/2002

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EXAMINER

KRISHNAN, GANAPATHY

ART UNIT	PAPER NUMBER
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1623

DATE MAILED: 12/18/2002

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/890,348

Applicant(s)

CHAUVELON ET AL.

Examiner

Ganapathy Krishnan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7 and 9-15 is/are rejected.
- 7) ☒ Claim(s) 5, 8 and 16-22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other:

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: On page 1, line 21, it is not clear what “followed by an acetylose deacetylation” means. If the applicants mean that the acetyl groups are hydrolyzed, then it should be clearly stated so. The phrase as recited is not clear. On page 6, the title of example 1 reads “Obtention of cellulose sulfoacetates”. This should be changed to “Preparation of cellulose sulfoacetates”. These are two of the errors pointed out in the specification. The applicant is required to correct these and other such errors appearing throughout the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3, 5-8, 12, 13 and 16 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 (i) recites, “suspending the cellulose material in glacial acetic acid solution and eliminating the excess acetic acid”. It is not clear what else is present after eliminating excess acetic acid since the term solution is recited. It is not clear if the glacial acetic acid is added as a solution in another solvent or if it is just glacial acetic acid. Step (ii) recites, “in a sulphuric acid

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solution in the glacial acetic acid". The claim as stated is not clear. In step (ii) if the cellulose material from step (i) is suspended in a mixture of sulphuric acid and glacial acetic acid, it should be stated so. The term "chosen" appearing before the term acetic in step (iii) should be removed. Also, the term "water soluble" which is more commonly used is preferred instead of "hydrosoluble".

Claim 2 should be restated "during which the reaction in step (iii) is stopped by adding a aqueous solution of acetic acid."

In Claim 3 step (v), it is not clear what "optionally centrifuging" means. In step (vi) it is not clear what is meant by "eliminating the optionally obtained residue". The term "discarding" is suggested instead of "eliminating". In step (vii), the terms "optionally generated" should be removed. Replace the term "eliminating" with the term "discarding" in step (viii). Step (ix) recites "neutralizing the supernatant by optional cooling". This is not clear. Neutralization is usually done with a base. Step (ix) should be restated as, "cooling the supernatant and neutralizing with a base".

In Claim 5 the term "put" should be replaced by the term "kept".

In Claim 6 the term "about" is misspelled.

In Claim 7 instead of the term "followed", the term "monitored" is suggested.

In Claim 8, the dependency should be changed to claim 7 or another preceding claim as appropriate.

In Claim 12, the term "in" after selected should be changed to "from". The phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 13 recites “adapted to be obtained using a process...”. It is not clear what “adapted to be obtained” means. Either the claim should be restated to clearly convey what is meant or the said phrase should be removed.

In Claim 16 the terms “cycles of said derivatives” should be removed.

Joint Inventors

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1-4, 6, 7, 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanghe et al (“Methods in Carbohydrate Chemistry”, 1963, vol. III, 193-195) in combination with, Hiatt et al (USPN 3,075,962), Tunc et al (USPN 4,005,251) and Araki (“Acetylation of

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Cellulose, I. The Mechanism of Acetylation and The Properties of The Intermediate Products”,
Journal of the Society of Chemical Industry, 1940, vol. 48 (2), 99 49B-52B, English
Translation).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459
(1966), that are applied for establishing a background for determining obviousness under 35
U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-4, 6, 7, 9-15 are drawn to a process for producing cellulose sulfoacetates derivatives through the esterification of a cellulose material by swelling in acetic acid and then esterifying with acetic anhydride in the presence of sulfuric and acetic acids; stopping the reaction by adding aqueous solution of acetic acid; maintaining the pH while adding sodium hydroxide so that the pH does not exceed 10; the quantity of acetic anhydride chosen is 3.2 mols/mol of anhydroglucose; esterification time is 20 to 30 minutes; esterification temperature is 40°C; starting cellulose material is selected from the group comprising cellulose residues purified from coproducts derived from agriculture, wood cellulose or microcrystalline cellulose; and a derivative blend having a sulfation degree ranging from 0.2 to 0.6.

Tanghe et al teach the acetylation of cotton linters (see page 194-195). The cotton linters are first shaken well with glacial acetic acid. The cellulose is then shaken with acetic acid and sulfuric acid at 25°C for one minute. This is followed by addition of acetic anhydride and shaking for another 15-30 minutes. The temperature is also around 35°C during this step. Water

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and acetic acid are added and stirred to destroy the acetic anhydride. At this point the reaction is stopped. This final step of stopping the reaction by adding aqueous solution of acetic acid can be done by adjusting the amount of water and the period of stirring the reaction mixture so that the sulfate group is not hydrolyzed off. Tanghe et al teach purification of the product obtained in their process by precipitating the product with distilled water, washing and drying. In Tanghe et al's process the insoluble triacetate is precipitated out. By adjusting the amount of water and acetic acid in the final step of stopping the reaction the cellulose sulfoacetates derivatives can be kept in solution so that on addition of water precipitates the insoluble triacetate that precipitates out. This precipitate can be filtered and discarded and the water-soluble cellulose sulfoacetate can be isolated from the solution. One of ordinary skill in the art can incorporate this modification in the process.

However, Tanghe et al do not teach the neutralization of with base and maintaining the pH, derivative blend with sulfation degree of 0.2 to 0.6 and the use of cellulose from other sources.

Hiatt et al drawn to preparation of cellulose sulfate derivatives teaches the use of wood pulp as the starting material in their process wherein a similar reaction using acetic anhydride and sulfuric acid is disclosed (see example 1, col. 2).

Tunc drawn to the preparation of alkali ester sulfates, teaches the preparation of sulfated cellulose esters by first forming the sulfate derivative and the esterifying with an acylating agent (see col. 3, lines 5-8). Example 1 (see col. 6) describes the process and Table I (see bottom of columns 7, 8, and column 3, lines 18-26) gives the acetyl and sulfate substitution degrees and the effect of pH. Tunc also uses excess acetic anhydride for the esterification and the esters obtained

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in the process have acetylation degree of 1.87-2.62 and sulfation degree of .42-.27 (Table 1). This information also serves as a guide in manipulating the amount of acetic anhydride in the instant process so as to obtain a sulfation degree of about 0.2-0.6. Even though in Tunc 's process the neutralization is done with a base to precipitate as an alkali salt in the pH range of 3-8 (col. 3, lines 18-26). This information can be used as a guide by one of ordinary skill in the art in the instant process. In the instant case the pH can be adjusted by adding sodium hydroxide as done in Tunc's process and maintained at 7 so that the sulfate group remains protonated at the neutral pH and excess acid can be neutralized.

Araki et al also drawn to cellulose esters, teaches esterification of cotton fibers using acetic anhydride, glacial acetic acid and sulfuric acid (see english translation). Page 2 gives reaction conditions for acetylation. Table 1 on page 3, gives results of the process samples. The table gives the esterification time, the sulfate content and also shows that the samples 1-3 give water soluble material. This information of Araki also serves as a guide with regard to temperature and duration of the reaction and the solubility of the cellulose esters.

Hence the combined teachings of Tanghe, Hiatt, Tunc and Araki, provide information about process steps and conditions and reagents which can be used by one of ordinary skill in the art in a process to produce water soluble cellulose sulfoacetates.

One of ordinary skill will be motivated to do so, since the combination of the procees steps of Tanghe with the process conditions of Hiatt, Tunc, and Araki can provide the optimal conditions for the preparation of cellulose sulfoacetates that are water soluble.

Claims 5, 8, and 16-22 are objected to since they are all dependent on base claims that have been rejected.

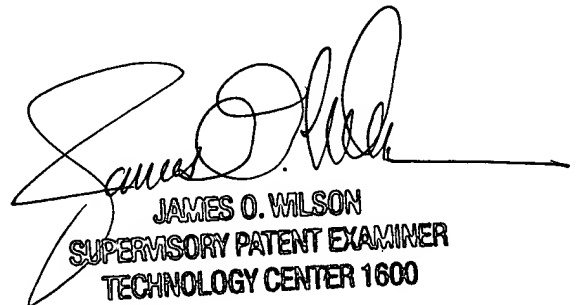
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ganapathy Krishnan whose telephone number is 703-305-4837. The examiner can normally be reached on 8.30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 703-308-4624. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.

GK
December 16, 2002



JAMES O. WILSON
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600